Crestron **DM-RMC-100**
DigitalMedia™ Room Controller
Operations & Installation Guide

CRESTRON®

This document was prepared and written by the Technical Documentation department at:

Contents

# DigitalMedia™ Room Controller: DM-RMC-100

Introduction

The DigitalMedia™ (DM) Room Controller (RMC) is a digital media receiver and display controller designed to convert DigitalMedia to regular HDMI. It features a low-profile design perfect for installing behind flat panel screens and above ceiling mounted projectors.

Features and Functions

- DigitalMedia receiver and display controller
- HDMI display output
- Choice of standard DM or DM Fiber inputs
- USB HID keyboard/mouse port
- 10/100 Ethernet LAN port
- RS-232, IR, digital in and relay control ports
- Meets requirements for plenum-rated ceilings
- Low-profile design
- Mounts to a 1900, 2-gang, 4-inch square or Euro electrical box

Applications

The following diagram shows a DM-RMC-100 in a small classroom application.

DM-RMC-100 in a Classroom Application
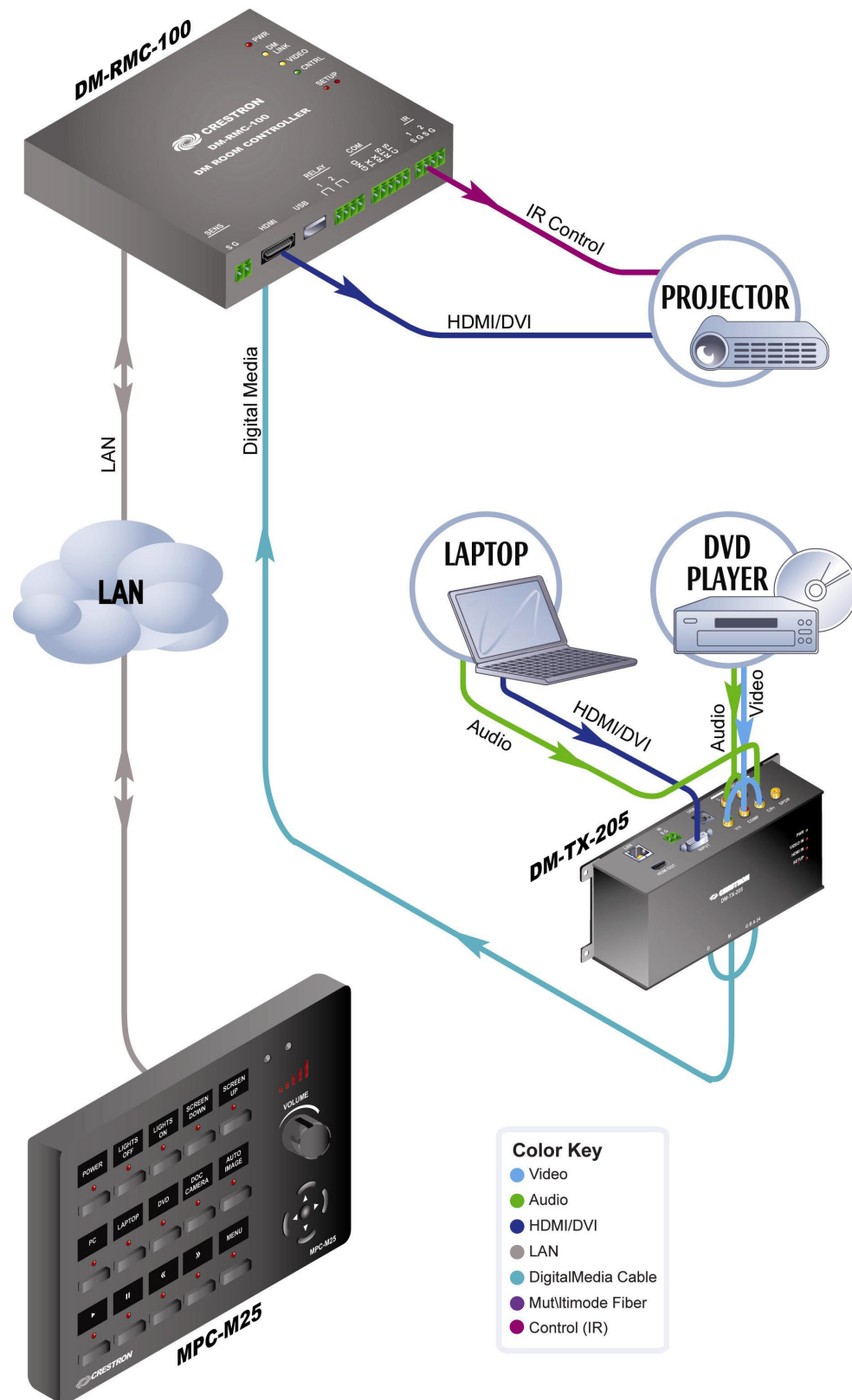
For more information on this and other DM-RMC-100 applications, refer to the latest revision of the Crestron DigitalMedia™ Design Guide (Doc. 4789), which is available from the Crestron website (www.crestron.com/manuals).

Specifications

Specifications for the DM-RMC-100 are listed in the following table.

DM-RMC-100 Specifications

| SPECIFICATION	DETAILS
Power	
DMNet Power Usage	6 watts (0.25 Amps @ 24 Volts DC)
Environmental	
Temperature	41º to 104º F (5º to 40º C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	21 BTU/Hr
Dimensions	
Height	4.53 in (11.51 cm)
Width	5.15 in (13.08 cm)
Depth	1.41 in (3.58 cm)
Weight	0.86 lbs (0.39 kg)

Physical Description

This section provides information on the connections, controls and indicators available on your DM-RMC-100.

DM-RMC-100 Overall Dimensions (Front View)
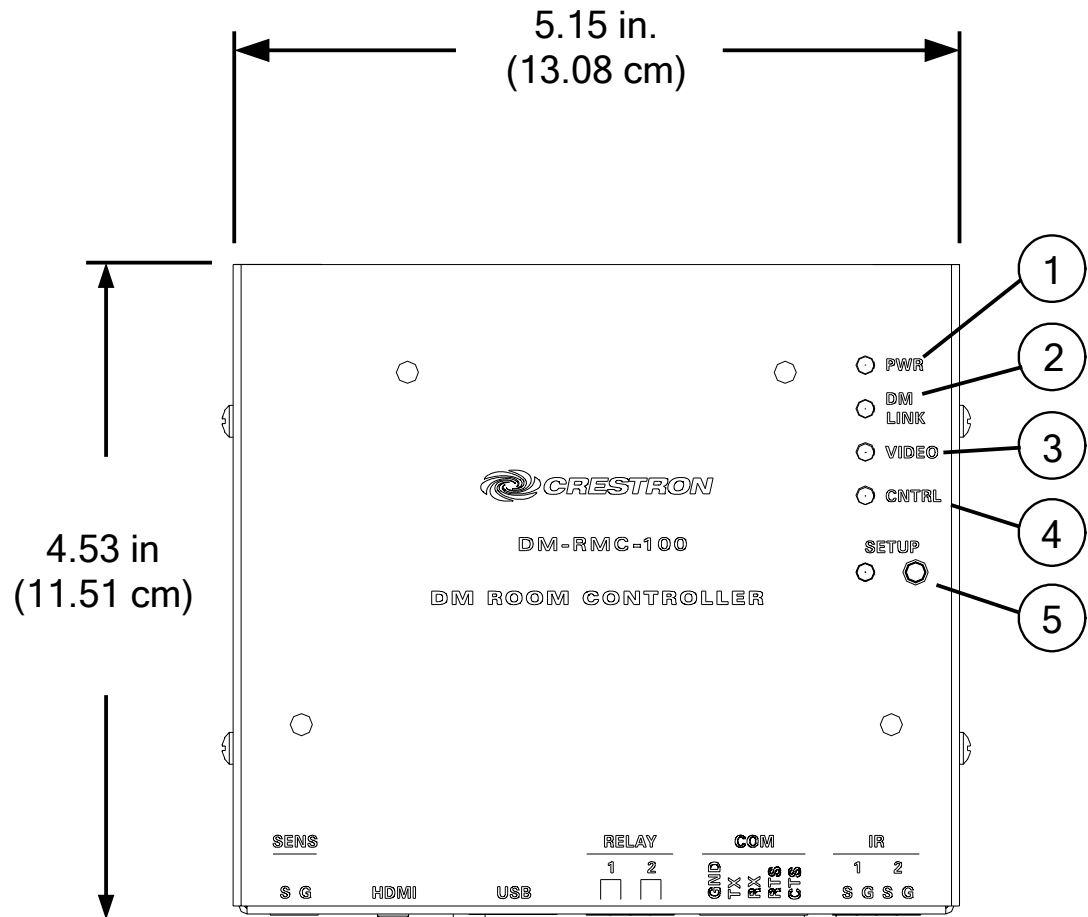
DM-RMC-100 Overall Dimensions (Bottom View)
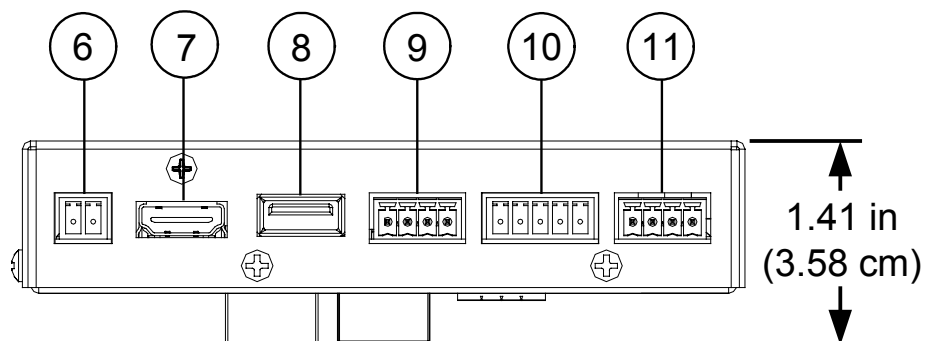
DM-RMC-100 Overall Dimensions (Rear View)
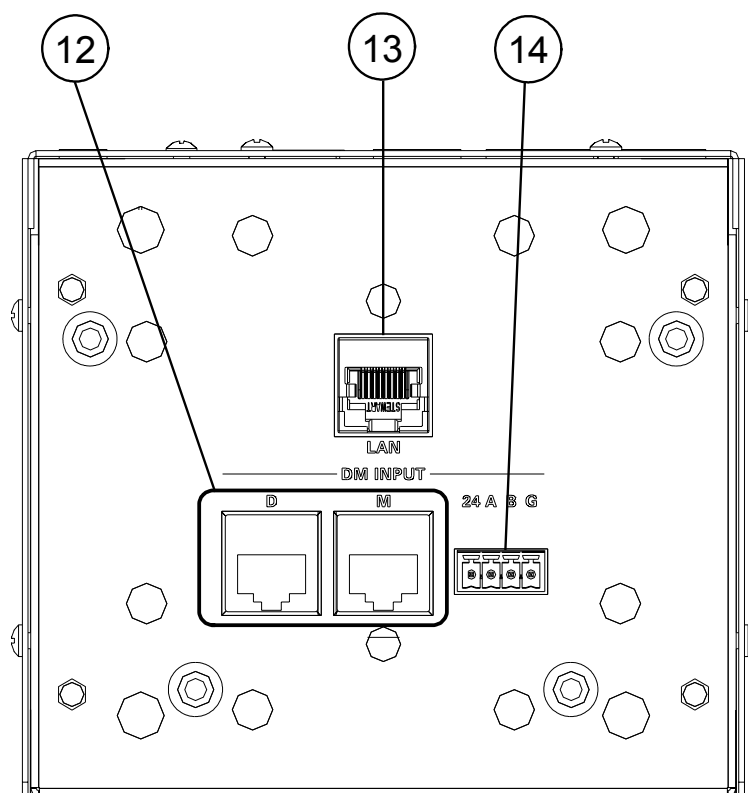
Connectors, Controls & Indicators

#	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
1	PWR LED	(1) Green LED indicates operating power supplied via DMNet control network.
2	DM LINK LED	(1) Amber LED indicates a connection to an upstream DM device.
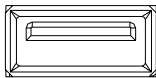
(Continued on following page)

Connectors, Controls & Indicators (Continued)

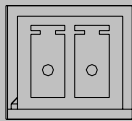| #	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
3	VIDEO LED	(1) Red/green dual color LED indicates video signal presence and lock status: **Green**: Indicates that the device is receiving video **Red**: Indicates no video **Blinking Red/Green**: Indicates errors in the video stream.
4	CNTRL	(1) Red/green dual-color LED indicates Ethernet connection and control system communication status.
5	SETUP	(1) Red LED and (1) miniature recessed pushbutton, for Ethernet auto-discovery.
6	SENS	(1) 2-pin 3.5mm detachable terminal block; Digital/contact closure sensing input Rated for 0-24 Volts DC, referenced to GND Input Impedance: 2.2k ohms pulled up to 5 Volts DC Logic Threshold: 2.5 Volts DC nominal with 1 Volt hysteresis band.
7	HDMI	(1) 19-pin Type A HDMI female; HDMI digital video/audio output

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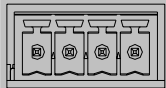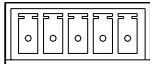*Connectors, Controls & Indicators (Continued)*

#	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
8	USB	(1) USB Type A female USB 1.1 port for mouse, keyboard, game controller, or other USB HID device.
9	RELAY 1, 2	(1) 4-pin 3.5mm detachable terminal block comprising (2) normally open, isolated relays; Rated 2 Amp, 50 Volts AC/DC MOV arc suppression across contacts.
10	COM	(1) 5-pin 3.5mm detachable terminal block, bidirectional RS-232 port; Up to 115.2k baud, hardware and software handshaking support.
11	IR 1, 2	(1) 4-pin 3.5mm detachable terminal block comprising (2) IR/Serial ports; IR output up to 1.1 MHz 1-way serial TT/RS-232 (0-5 Volts) up to 19200 baud.
12	DM INPUT[2, 3]	(1) DM input composed of (2) 8-pin RJ-45 female, shielded; Connects to DM output of a DM switcher, transmitter, or other DM device via DM-CBL or CresCAT-D cable.[4]

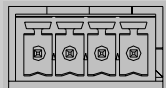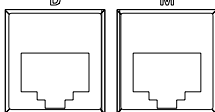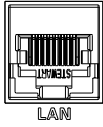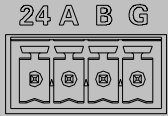*(Continued on following page)*

Connectors, Controls & Indicators (Continued)

#	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
13	LAN[3]	(1) 8-wire RJ-45 female; 10BaseT/100BaseTX Ethernet switch port.
14	DMNet[5, 6] 24 A B G	(1) 4-pin 3.5mm detachable terminal block, DMNet port; Connects to DMNet port of a DM switcher, transmitter, or other DM device via DM-CBL or CresCAT-D cable.[4]

1. Interface connectors for **SENS**, **RELAY**, **COM** and **IR** ports are provided with the unit.
2. The **DM INPUT** port consists of two separate RJ-45 connectors that are labeled **D** and **M**. The **D** port carries video signal. The **M** port carries data. Refer to the tables below, and on the following page, for the wires pin assignments.

D Port

PIN #	SIGNAL	DESCRIPTION
1	DATA D0+	HDMI Blue
2	DATA D0-	HDMI Blue
4	DATA D1+	HDMI Green
5	DATA D1-	HDMI Green
7	DATA D2+	HDMI Red
8	DATA D2-	HDMI Red
3	CLK-	HDMI Clock
6	CLK +	HDMI Clock

M Port

PIN #	SIGNAL	DESCRIPTION
1	+5V	+5V Power
2	I2C_DATA	HDCP & EDID Data
3	E_TX-	10/100BaseT Transmit
6	E_TX+	10/100BaseT Transmit
4	E_RX-	10/100BaseT Receive
5	E_RX+	10/100BaseT Receive
7	I2C_CLK	HDCP & EDID Clock
8	+5V_RTN	+5 Power Return

3. To determine which is pin 1 on the cable, hold the cable so that the end of the eight pin modular jack is facing away from you, with the clip down and copper side up. Pin 1 is on the far left.

4. For DigitalMedia wiring, use DM-CBL DigitalMedia Cable, CresCAT-D, or quality CAT5e/CAT6 cable. Do NOT use low-skew cable. Refer to the latest version of the Crestron DigitalMedia Design Guide (Doc. 4789) for complete wiring guidelines.

5. DMNet wiring is not compatible with Cresnet® wiring. DMNet wiring cannot be daisy chained.

6. Refer to the table below for the pinout of the **24 A B G** port.

24 A B G Port

PIN #	SIGNAL	Color
24	24V DC	Red
A	DMNet +	Orange
B	DMNet -	Grey
G	Ground	Black

Industry Compliance

This unit has been manufactured to comply with UL's Standards for Safety in Canada and the United States. Formal approval is pending.

As of the date of manufacture, the DM-RMC-100 has been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.

$$CE \quad \mathcal{C}$$

NOTE: This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

Setup

Network Wiring

When wiring the DMNet network, consider the following:

> **NOTE:** DMNet wiring and Cresnet® wiring are not compatible.

- Use Crestron Certified Wire.

- Use Crestron power supplies for Crestron equipment.

- Provide sufficient power to the system.

- For DigitalMedia wiring, use DM-CBL DigitalMedia Cable, CresCAT-D, or quality CAT5e/CAT6 cable. Do NOT use low-skew cable. Refer to the latest revision of the Crestron DigitalMedia Design Guide (Doc. 4789) for complete wiring guidelines.

> **CAUTION:** Insufficient power can lead to unpredictable results or damage to the equipment. Please use the Crestron Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

For more details, refer to "Check Network Wiring" on page 20.

Installation

To prevent overheating, do not operate this product in an area that exceeds the environmental temperature range listed in the table of specifications.

The following is required for installation:

- DigitalMedia™ cable or CresCAT-D cable (not supplied) terminated with RJ-45 connector for media signals and mini-phoenix connector for DMNet signals. Refer to "Network Wiring" on page 11.

- Phillips screwdriver (not supplied)

- Four #06-32 x 1/4" pan head Phillips screws (supplied)

- Metal mounting plate (supplied)

- 4-Pin connector plugs (supplied)

It is assumed that DigitalMedia cable (DM-CBL) has been fed through an installed two-gang electrical box, 85mm European or 1900 electrical box (not supplied) and wiring has been verified. Use the following procedure to install the DM-RMC-100.

1. Confirm that DMNet system power is OFF.

2. Attach supplied connector plugs according to the pinout on pages 8 and 9.

3. Attach metal mounting plate to electrical box using two Phillips screws (not supplied).

4. Make **DM-INPUT** connections using DM-CBL.

   - Connect the RJ-45 terminated blue shielded DigitalMedia cable to the **DM-INPUT D** port.

   - Connect the yellow RJ-45 terminated CAT5e/CAT6 cable to the **DM-INPUT M** port.

   - Connect the DMNet cable with the supplied connector plug to the DM-RMC-100's **24 A B G** port.

5. Make the **LAN** connection to the DM-RMC-100's **LAN** port using an Ethernet cable with an RJ-45 connector.

6. Attach DM-RMC-100 to mounting plate using four #06-32 x 1/4" Phillips screws (supplied) as shown in illustration on the following page.

Mounting DM-RMC-100 into Electrical Box

METAL MOUNTING PLATE
(2019091)

DM-RMC-100

DRYWALL

MOUNTING SCREWS (4)
(2007215)
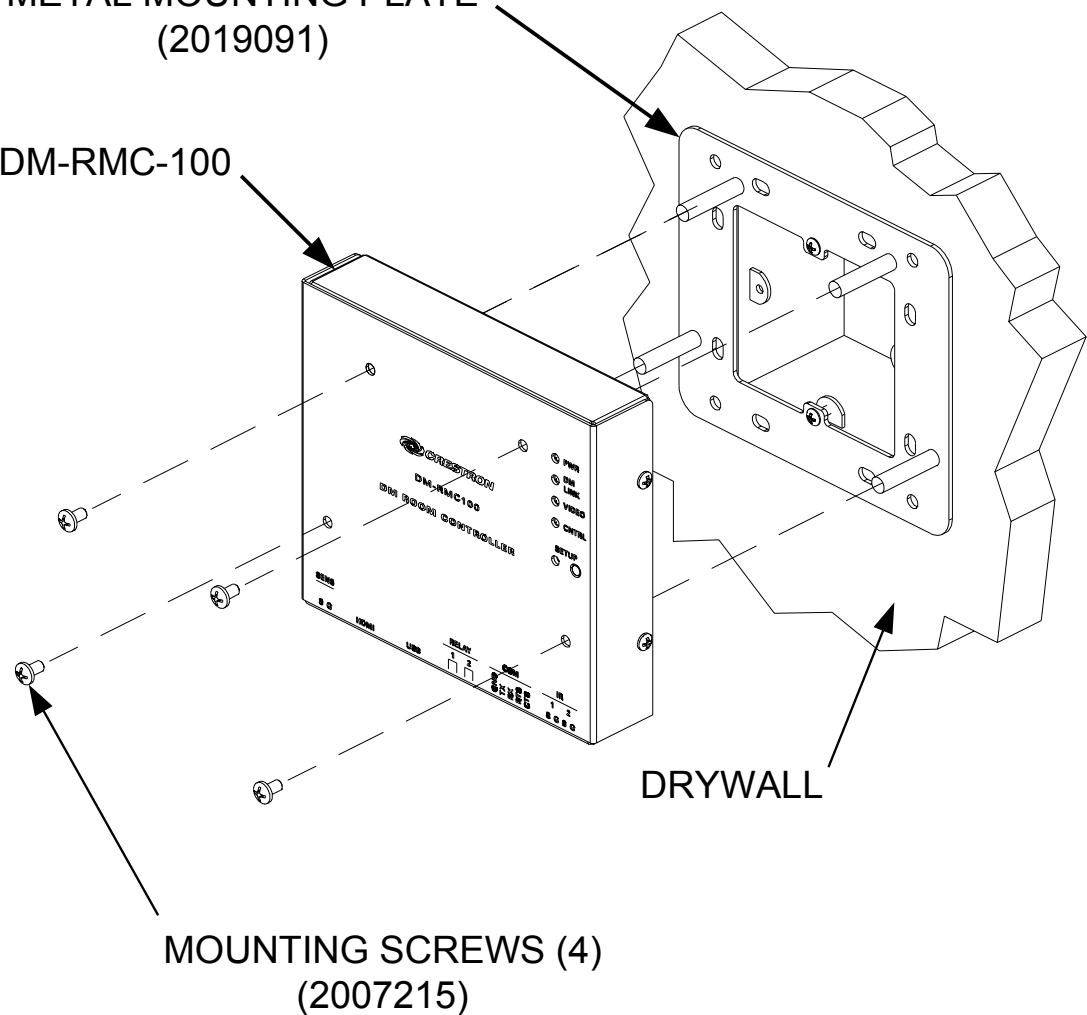
Hardware Hookup

Make the necessary connections as called out in the illustration that follows this paragraph. Refer to "Network Wiring" on page 11 before attaching the 4-position terminal block connector. Apply power after all connections have been made.

Hardware Connections for the DM-RMC-100 (Front View)
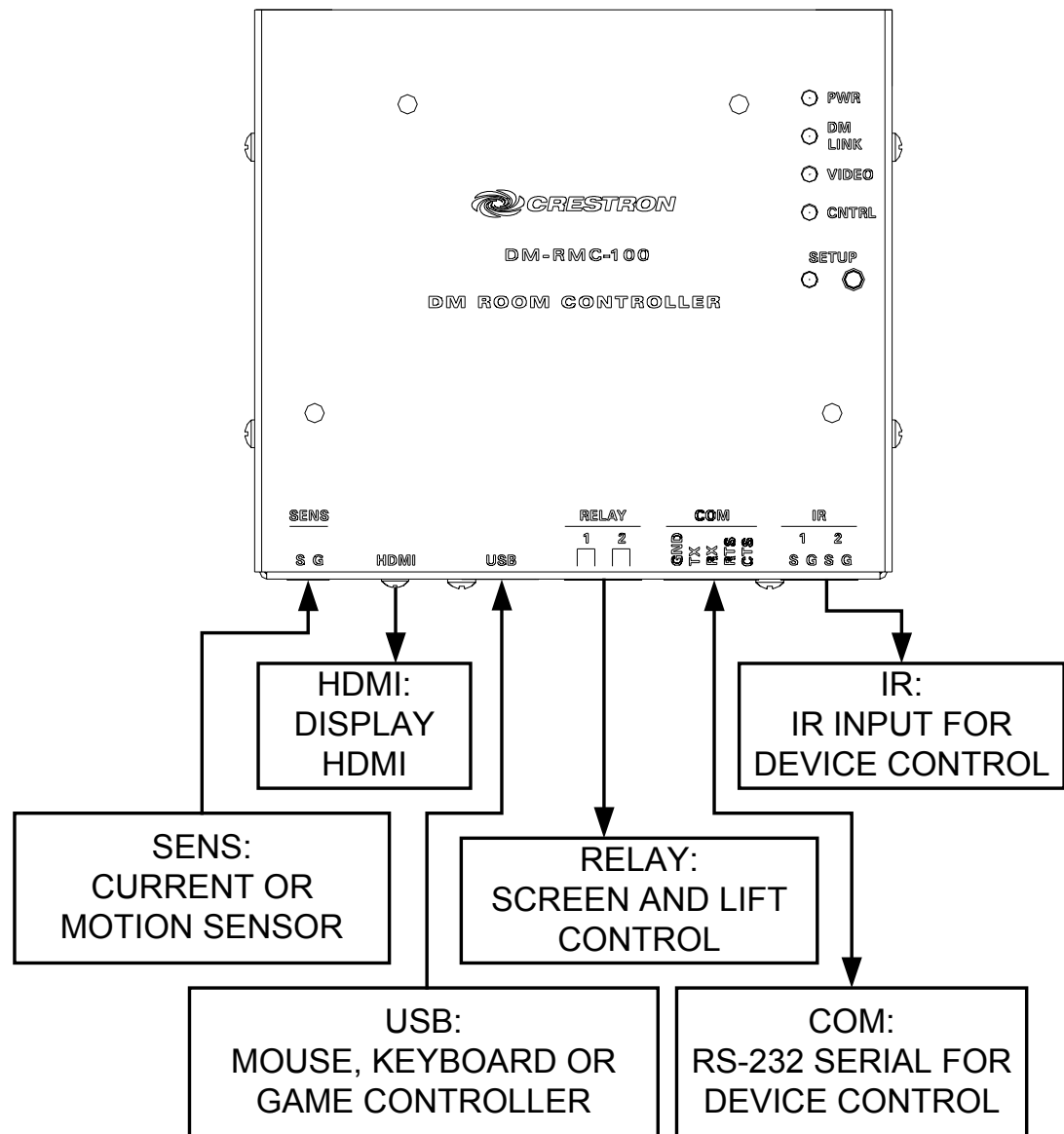
Hardware Connections for the DM-RMC-100 (Back View)
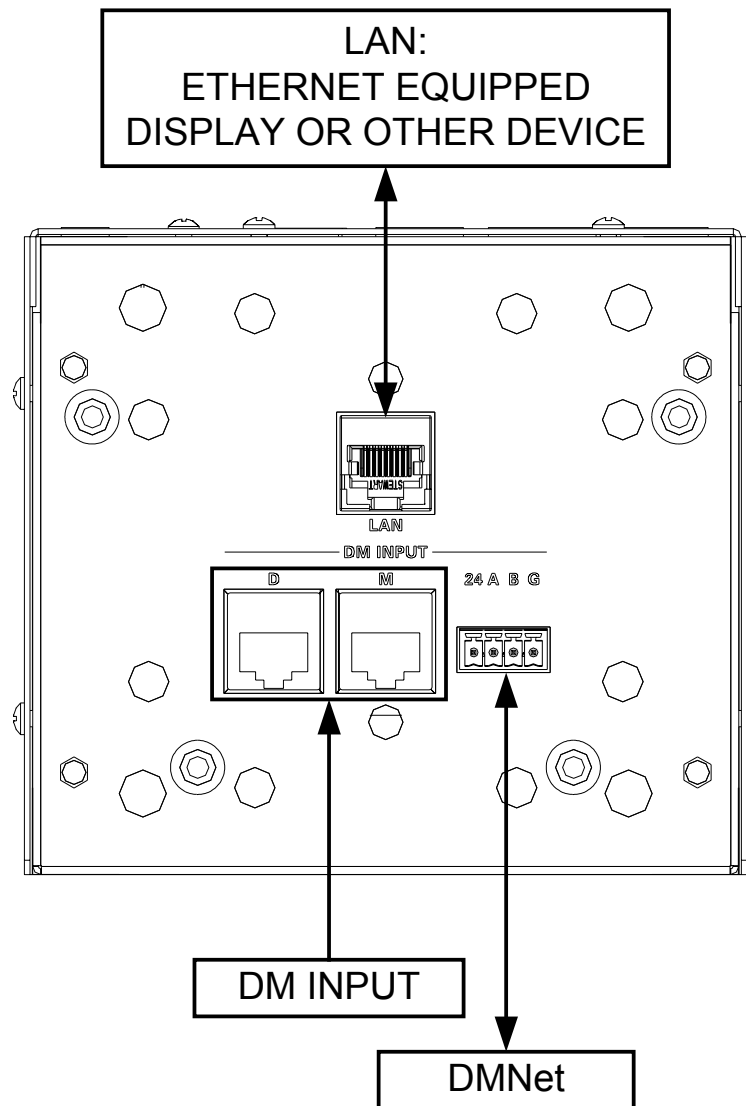
NOTE: Ensure the unit is properly grounded.

NOTE: For optimum performance, Crestron strongly recommends using DM-CBL DigitalMedia™ cable, available from Crestron. CresCAT-D or high-quality CAT5e/CAT6 wiring may also be used with varying performance. Do NOT use low-skew cable.

Uploading and Upgrading

Crestron recommends using the latest programming software and that each device contains the latest firmware to take advantage of the most recently released features. However, before attempting to upload or upgrade it is necessary to establish communication. Once communication has been established, files (for example, firmware) can be transferred to the device.

Establishing Communication

Use Crestron Toolbox™ for communicating with the DM-RMC-100; refer to the Crestron Toolbox help file for details. There is a single method of communication: indirect communication.

Indirect Communication

- DM-RMC-100 connects to a DigitalMedia™ switcher via DMNet.

- Establish communication between the PC and the DM switcher as described in the latest version of a DigitalMedia Switcher Operations Guide (Doc. 6755).

- Use the Address Book in Crestron Toolbox to create an entry for the DM-RMC-100 using the expected communication protocol (Indirect). Select the Cresnet ID of the DM-RMC-100 and the address book entry of the control system or DM Switcher that is connected to the DM-RMC-100.

- Display the DM-RMC-100's "System Info" window (click the ▇ icon); communications are confirmed when the device information is displayed.

Firmware

Firmware files may be distributed from programmers to installers or from Crestron to dealers. Firmware upgrades are available from the Crestron website as new features are developed after product releases. For details on upgrading, refer to the Crestron Toolbox help file.

Check the Crestron website to find the latest firmware. (New users may be required to register to obtain access to certain areas of the site, including the FTP site.)

Upgrade DM-RMC-100 firmware via Crestron Toolbox.

- Establish communication with the DM-RMC-100 and display the "System Info" window.

- Select **Functions | Firmware…** to upgrade the DM-RMC-100 firmware.

Program Checks

- Using Crestron Toolbox, display the network device tree (**Tools | Network Device Tree**) to show all network devices connected to the control system. Right-click on the DM-RMC-100 to display actions that can be performed on the DM-RMC-100.

Problem Solving

Troubleshooting

The following table provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

DM-RMC-100 Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Device does not function.	Device is not communicating with the network.	Use Crestron Toolbox to poll the network. Verify network connection to the device.
	Device is not receiving sufficient power.	Use the Crestron Power Calculator to help calculate how much power is needed for the system.
Video LED does not illuminate.	Device is not receiving video signal.	Ensure proper video signal is routed to repeater.
Video LED blinks red and green.	Problem with video source.	Verify source is operating.

(Continued on following page)

DM-RMC-100 Troubleshooting (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
DM LINK LED does not illuminate.	Device is not receiving DMNet signal.	Verify DMNet is properly attached.
PWR LED does not illuminate.	Device is not receiving power.	Verify DMNet is properly attached.
Loss of functionality due to electrostatic discharge.	Improper grounding.	Check that all ground connections have been made properly.

Check Network Wiring

Use the Right Wire

In order to ensure optimum performance over the full range of your installation topology, Crestron Certified Wire and only Crestron Certified Wire may be used. Failure to do so may incur additional charges if support is required to identify performance deficiencies because of using improper wire.

Calculate Power

CAUTION: Use only Crestron power supplies for Crestron equipment. Failure to do so could cause equipment damage or void the Crestron warranty.

CAUTION: Provide sufficient power to the system. Insufficient power can lead to unpredictable results or damage to the equipment. The **EIG** connector on the DM switcher is used to jumper in external power. Additional power is rarely required; switchers provide enough power for their maximum configuration of room controllers and repeaters. Please use the DMNet Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

Refer to the following table for maximum cable lengths for various cables.

Maximum Cable Length by Type

Cable Type:	DM-CBL DigitalMedia Cable		CresCAT-D Crestron Home® CAT5 AV Cable	
Resolution:	Maximum length between, before, or after repeaters	Maximum total length using up to 3 repeaters	Maximum length between, before, or after repeaters	Maximum total length using up to 3 repeaters
720p, 1080i, 1080p/24	200 ft (60 m)	450 ft (137 m)	150 ft (45 m)	400 ft (120 m)
1024x768 @75Hz	200 ft (60 m)	450 ft (137 m)	150 ft (45 m)	400 ft (120 m)
1080p/60	150 ft (45 m)	450 ft (137 m)	100 ft (30 m)	400 ft (120 m)
1280x1024 @75Hz	150 ft (45 m)	450 ft (137 m)	100 ft (30 m)	400 ft (120 m)
1920x1200 @60Hz	150 ft (45 m)	450 ft (137 m)	100 ft (30 m)	400 ft (120 m)
1600x1200 @60Hz	125 ft (38 m)	450 ft (137 m)	75 ft (23 m)	400 ft (120 m)
1080p/60 Deep Color	100 ft (30 m)	400 ft (120 m)	Not Supported	

NOTE: All Crestron certified DMNet wiring must consist of two twisted pairs. One twisted pair is the +24V conductor and the GND conductor and the other twisted pair is the A conductor and the B conductor.

Reference Documents

The latest version of all documents mentioned within the guide can be obtained from the Crestron website (www.crestron.com/manuals). This link will provide a list of product manuals arranged in alphabetical order by model number.

List of Related Reference Documents

DOCUMENT TITLE
Crestron DigitalMedia Design Guide
DigitalMedia Switcher Operations Guide

Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling Crestron at 1-888-CRESTRON [1-888-273-7876].

You can also log onto the online help section of the Crestron website (www.crestron.com/onlinehelp) to ask questions about Crestron products. First-time users will need to establish a user account to fully benefit from all available features.

Future Updates

As Crestron improves functions, adds new features and extends the capabilities of the DM-RMC-100, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron website periodically for manual update availability and its relevance. Updates are identified as an "Addendum" in the Download column.

Return and Warranty Policies

Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange or service without prior authorization from CRESTRON. To obtain warranty service for CRESTRON products, contact an authorized CRESTRON dealer. Only authorized CRESTRON dealers may contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number and return address.

2. Products may be returned for credit, exchange or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.

3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from CRESTRON, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touchscreen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from CRESTRON or an authorized CRESTRON dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

CRESTRON shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended or if it has been subjected to misuse, accidental damage, modification or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced or removed.

This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall CRESTRON be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. CRESTRON is not liable for any claim made by a third party or made by the purchaser for a third party.

CRESTRON shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty.

Except as expressly set forth in this warranty, CRESTRON makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supersedes all previous warranties.

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